Signal Booster Installation Guide

In-Line or 75 Ohm In-Line

17dB Adjustable Gain
800/1900 MHz
Smart Technology II™
Signal Booster

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Appearance of device and accessories may vary.

Note: This manual contains important safety and operating information. Please read and follow the instructions in this manual. Failure to do so could be hazardous and result in damage to your Signal Booster.

Wilson® Electronics, LLC

Installation Instructions for:

In-Line or 75 Ohm In-Line

17dB Adjustable Gain 800/1900 MHz Smart Technology II™ Signal Booster
Model # 276215 FCC ID: PWO276215 IC: 4726A-276215

The term “IC” before the radio certification number only signifies that Industry Canada technical specifications were met.

How it Works

The In-Line Signal Booster is designed to provide an additional 17dB gain to compensate for signal loss due to a long cable run or the use of taps or splitters. The In-Line Signal Booster allows installation of multiple inside antennas with minimal signal loss and is installed between a Wilson indoor Signal Booster, like the AG Pro Installer, and the Inside Antenna. Optimally, the In-Line Signal Booster is installed after long runs of cable and/or taps and splitters to compensate for the signal loss. The In-Line Signal Booster can be installed in the middle of a cable run or near the inside antenna.

The In-Line is designed to offset cable and splitter/tap loss for In-Building installations. It should be used on the Inside Antenna side of a Wilson Electronics In-Building Signal Booster such as the AG Pro 75™.

Inside this Package

Note: *Kits may contain different accessories*

In-Line
(806215 & 806715)

AC/DC Power Supply
6V / 2.5A
(859912)

Indoor Antenna Options

50 ohms	75 ohms
301135	301155
304451	304471
304452	304472
304453	304473

Tap Option

50 ohm
(859907)

Note: *Splitter Options on page 3.*

Appearance of device and accessories may vary.
To purchase, call Wilson Electronics Sales Department at: 800-204-4104

Contact Wilson Electronics Technical Support Team with any questions at 866-294-1660 or email: tech@wilsonelectronics.com. Mon.- Fri. Hours: 7 am to 6 pm MST.

Quick Install Overview

Refer to Installation Diagrams on page 3 & 4. Contact Wilson Electronics Technical Support Team with any questions at 866-294-1660.

1. Install In-Building Signal Booster (such as the AG Pro 75™ sold separately). Use the installation guide for the model you purchased to install.

2. Select a location to install the In-Line that is away from excessive heat, direct sunlight, moisture and has proper ventilation. Do not place the In-Line in an air-tight enclosure.

3. The In-Line should be placed where it can make up for installation gain loss due to cable, taps or splitters. Optimal location is near or directly connected to the Inside Antenna.

4. a) Connect a cable to the In-Building Signal Booster at the connector labeled "Inside Antenna."

   b) Run the cable to the In-Line, attach to the connector labeled "Outside Antenna."

   c) From the In-Line connector marked "Inside Antenna" run a cable to the Inside Antenna. For more information on running cable (refer to diagrams on pages 3 & 4).

5. Before powering up the In-Line, verify that all cables are connected and check that all connections are tight.

   Note: *Be careful when plugging the connectors in so as not to bend the center pins on the connectors.*

6. The In-Line has been packaged with the gain control knobs adjusted to the highest gain position. If one or both of the lights are not green (refer to pages 9 & 10).

⚠ ***Warning:*** Connecting the Signal Booster directly to a cell phone with use of an adapter may damage the cell phone and/or the Signal Booster.

Before Getting Started

This guide will help you properly install your Wilson Electronics Signal Booster. **It is important to read through all of the installation steps for your particular application prior to installing any equipment.** Read through the instructions, visualize where all the equipment will need to be installed and do a soft installation before mounting any equipment. Contact Wilson Electronics Technical Support with any questions at: 866-294-1660.

Installation Diagrams

Note: *Do not install the In-Line without an In-Building Signal Booster between the Outside Antenna and In-Line.*

Note: *Install the In-Line as close as possible to Inside Antenna for optimal performance.*

Splitter Options

2-Way (859957)
50 ohm

3-Way (859980)
50 ohm

4-Way (859981)
50 ohm

2-Way (859993)
75 ohm

3-Way (859994)
75 ohm

Figure 1
One In-Line & One Inside Antenna

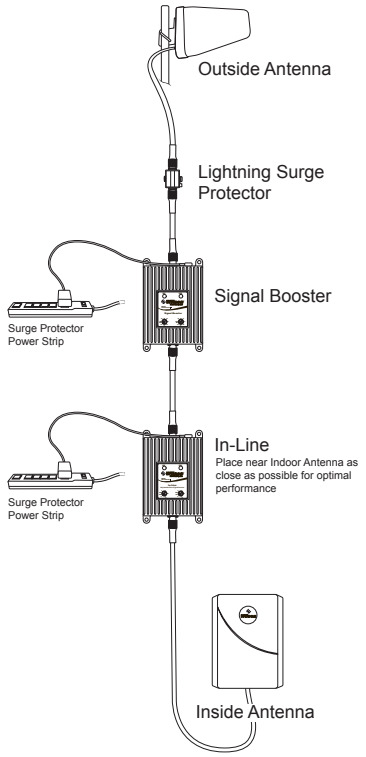


Figure 2
One In-Line & Two Inside Antennas

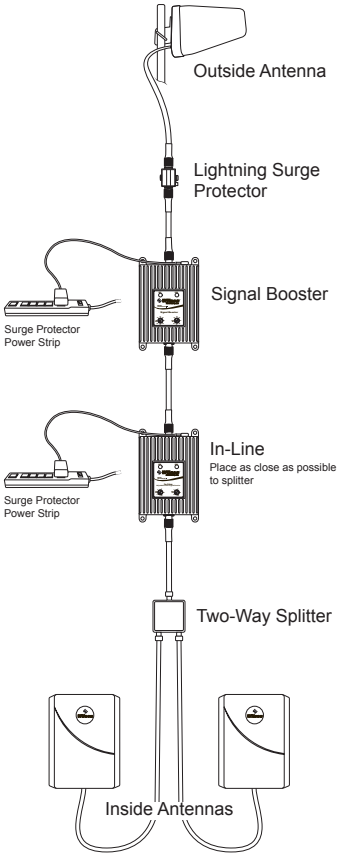
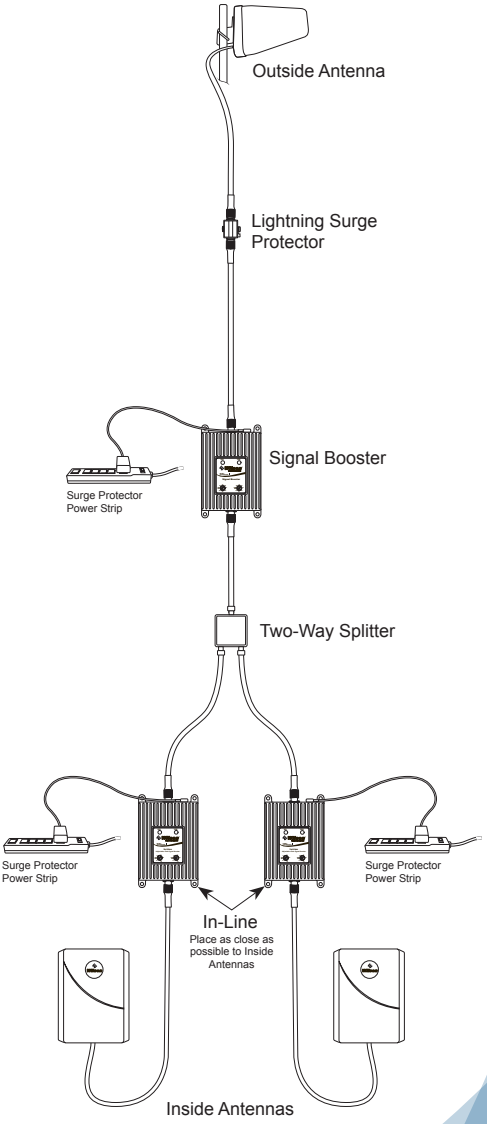


Figure 3
Two In-Lines & Two Inside Antennas



Reasons for Using an In-Line with In-Building Installations

Covering multiple rooms or even floors of a building can be challenging as each is a different size and shape. Balancing the signal coverage can require multiple attenuators, cables, taps and splitters. All of these can decrease your system gain and coverage. Reasons to install an In-Line include:

1. Cable loss – Long runs of cable from the Inside Antenna to the main In-Building Signal Booster may have significant loss or require Wilson 400 low-loss cable.

2. Splitter loss – When multiple rooms must be evenly covered, a splitter evenly divides the signal for separate Inside Antennas. Each division reduces system gain and inside coverage area.

3. Tap loss – Taps pass the signal with low attenuation out one port and pass the signal with high attenuation port continues on to another location possibly with more splitters and taps downstream. The attenuation port typically runs directly to an Inside Antenna.

4. Increased system dynamic range – A user who gets too near an Inside Antenna can lower the gain and coverage area for all other users. The In-Line adds dynamic range to the In-Building installation and reduces use of the main Signal Booster automatic gain control.

The In-Line overcomes the losses associated with large In-Building installations. The In-Line recovers inside coverage area that is normally lost due to cable, splitter and tap loss. By installing the In-Line near an Inside Antenna, uplink noise figure is minimized and downlink power is maximized. Additionally, the In-Line enhances performance of the main Signal Booster by increasing the systems gain and input signal dynamic range. The variable gain knobs on the In-Line allow for simple, quick signal level balancing and installation.

Installing the Wilson Electronics In-Line

Select a location to install the In-Line that is away from excessive heat, direct sunlight, moisture and has proper ventilation. Do not place in an air-tight enclosure. Recommended installation locations for the In-Line are:

- On a shelf
- In a closet
- Near a power outlet
- Near the Inside Antenna
- Where there is more than 5dB loss between In-Building Signal Booster and Inside Antenna

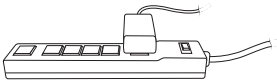
Note: *It is important to have adequate air ventilation. Maintain at least 6 inches of clearance from surrounding objects.*

The In-Line should be placed where it can make up for installation gain loss due to cable, taps or splitters. Optimal location is near or directly connected to the Inside Antenna.

Note: *For distances of 20 feet or more, use Wilson low loss cable to prevent significant signal loss or contact Wilson Electronics Technical Support Team for assistance: 866-294-1660.*

Note: *Be careful when plugging the connector in so as not to damage the center pins on the connectors.*

IMPORTANT NOTICE



- It is very important to power your Signal Booster using a surge protected AC Power Strip with at least a **1000 Joule rating.**
- Failure to do this will void your warranty in the event of a power surge or lightning strike.

Powering up a Wilson Electronics In-Line

1. Never point the front of a Directional Outside Antenna toward the Inside Antenna. Refer to Figures 4 & 5 on page 8.

2. Run the antenna cable from the In-Building Signal Booster “Inside Antenna” connector to the In-Line “Outside Antenna” connector and attach to both connectors. Run the Inside Antenna cable to the In-Line and attach it to the connector labeled “Inside Antenna” on the In-Line. For more information refer to pages 3 & 4.

3. Plug the power supply into the In-Line input marked “POWER” (carefully, to avoid damaging the center pin) and then into a surge protected AC Power Strip with at least a **1000 Joule rating.**

4. If the In-Line does not have two green lights, please refer to pages 9 & 10.

5. If you know that only one frequency band (800 or 1900) is available in your coverage area (or going to be used), reduce the gain control on the frequency band that is NOT in use to the lowest setting. This will reduce the power consumption of the In-Line.

6. Using multiple In-Building Signal Boosters other than the In-Line in one installation could cause interference to the cell tower.

7. Contact Wilson Electronics Technical Support Team with any questions at 866-294-1660 or email tech@wilsonelectronics.com. Technical Support hours are Mon.- Fri. 7 am to 6 pm MST.

Figure 4

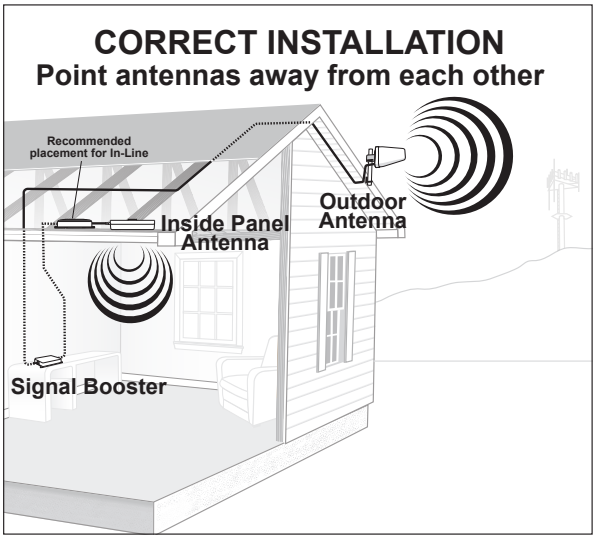
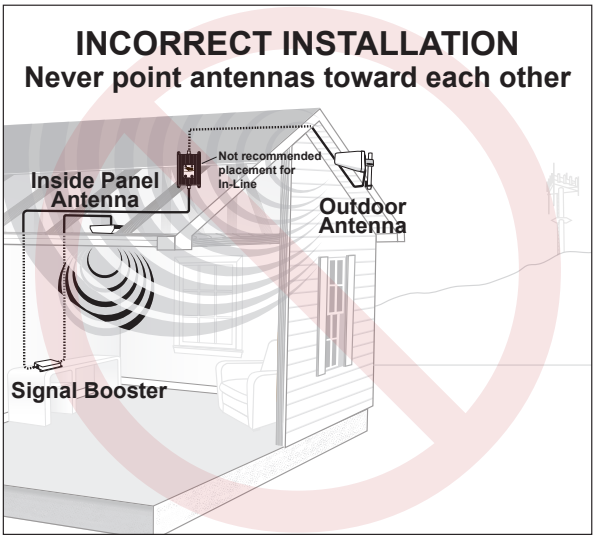


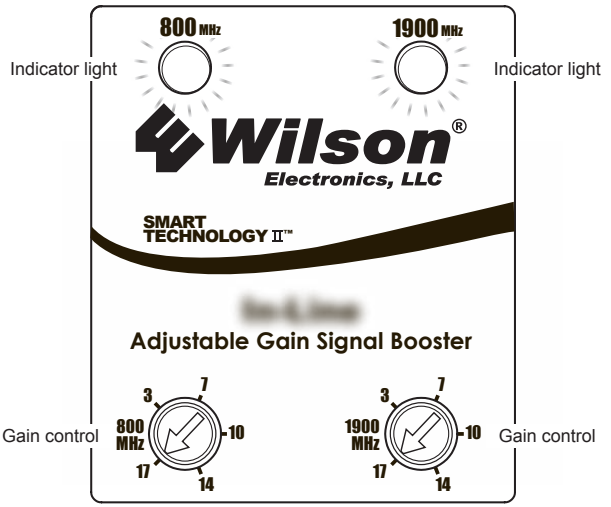
Figure 5



Understanding the In-Line Lights and Troubleshooting

The In-Line is equipped with two indicator lights, one for the 800 MHz band and the other for the 1900 MHz band. During this time, both lights will do one of the following 2 things:

Figure 6



Note: *The In-Line can be reset by disconnecting and reconnecting the power supply from the Signal Booster.*

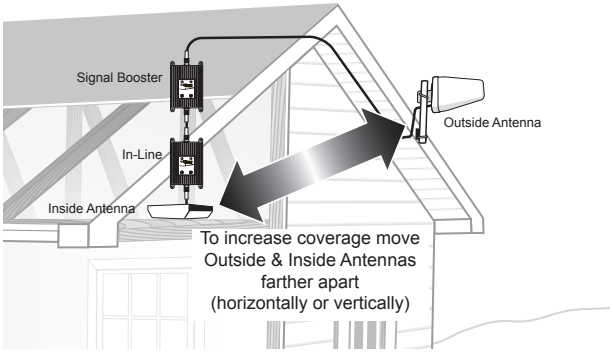
1. GREEN

If the indicator lights are green, the In-Line is operating properly. If you are happy with the coverage area in your building, then you are done.

2. RED

If either of the two indicator lights on the In-Line are red, this indicates that the In-Line has shut down on that frequency to prevent an oscillation (feedback). First, make sure that all the connections are tight. Then reduce the gain for that frequency in small increments by rotating the gain control, counter clockwise, waiting 5 seconds between each adjustment for the In-Line to reset (it may take up to 3 minutes for the In-Line to reset). Continue this adjustment until the indicator light turns green. When you are turning down the gain, you are reducing the inside coverage area. If the amount of coverage area is sufficient for your needs and the light is green, the installation is complete. If the coverage area is not large enough, it is necessary to increase the separation distance of the antennas by moving them horizontally or vertically farther apart, or both (see Figure 7 below). Then increase the gain until the red light comes on and then slightly keep decreasing the gain until the green light appears. If after separating the antennas your coverage area is still too small, contact Wilson Electronics Technical Support Team for assistance: 866-294-1660.

Figure 7



The In-Line can be reset by disconnecting and reconnecting the power supply from the Signal Booster.

Warnings and Recommendations

⚠ Warning: The Directional Antenna must always be located so the back or side points to the Inside Antenna. Never point the front of the Outside Antenna toward the Inside Antenna – this is to prevent oscillation.

⚠ Warning: Connecting the In-Building Signal Booster directly to the cell phone with use of an adapter will damage the cell phone.

⚠ Warning: Use only the power supply provided. Use of a non-Wilson Electronics product may damage your equipment.

⚠ Warning: **RF Safety**: FCC regulations require that the Inside Antenna used with this Signal Booster be listed on page 1 of this installation guide. Use of other antennas is not permitted. The antenna must be located 8 inches or more from all persons.

⚠ Warning: Verify that both the Outside Antenna and the Inside Antenna are connected to the In-Building Signal Booster & In-Line before powering them up.

Recommendation: *Lightning Surge Protection is recommended for all in-building installations.*

This device complies with Part 15 of FCC rules. Operation is subject to two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by Wilson Electronics could void the authority to operate this equipment.

About Wilson Electronics

Wilson Electronics, LLC has been a leader in the wireless communications industry for over 40 years. The company designs and manufactures Signal Boosters, antennas and related components that significantly improve cellular phone signal reception and transmission in a wide variety of applications, mobile (vehicle, RV, marine) and in-building (home, office, machine to machine).

With extensive experience in antenna and Signal Booster research and design, the company's engineering team uses a state-of-the-art testing laboratory, including an anechoic chamber and network analyzers, to fine-tune antenna designs and performance. For its Signal Boosters, Wilson Electronics uses a double electrically shielded RF enclosure and cell tower simulators for compliance testing.

Wilson Electronics Signal Boosters feature patented Smart Technology II™ that enables them to automatically adjust their power based on cell tower requirements. By detecting and preventing oscillation (feedback), signal overload and interference with other users, these Smart Technology II™ Signal Boosters improve network cell phone areas without compromising carrier systems.

All products are engineered and assembled in the company's 100,000-square-foot headquarters in St. George, Utah. Wilson Electronics has product dealers in all 50 states as well as in countries around the world.

30-Day Money-Back Guarantee

All Wilson Electronics products are protected by Wilson Electronics 30-day money-back guarantee. If for any reason the performance of any product is not acceptable, simply return the product directly to the reseller with a dated proof of purchase.

2-Year Warranty

Wilson Electronics Signal Boosters are warranted for two (2) years against defects in workmanship and/or materials. Warranty cases may be resolved by returning the product directly to the reseller with a dated proof of purchase.

Signal Boosters may also be returned directly to the manufacturer at the consumer's expense, with a dated proof of purchase and a Returned Material Authorization (RMA) number supplied by Wilson Electronics. Wilson Electronics shall, at its option, either repair or replace the product. Wilson Electronics will pay for delivery of the repaired or replaced product back to the original consumer if located within the continental U.S.

This warranty does not apply to any Signal Booster determined by Wilson Electronics to have been subjected to misuse, abuse, neglect, or mishandling that alters or damages physical or electronic properties.

Failure to use a surge protected AC Power Strip with at least a 1000 Joule rating will void your warranty.

RMA numbers may be obtained by contacting Technical Support at 866-294-1660.

Disclaimer : The information provided by Wilson Electronics, LLC is believed to be complete and accurate. However, no responsibility is assumed by Wilson Electronics, LLC for any business or personal losses arising from its use, or for any infringements of patents or other rights of third parties that may result from its use.

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U.S. Patent Nos. – 7,221,967; 7,729,669; 7,486,929; 7,409,186; 7,783,318

In-Line Specifications

Part #		806215	806715
Model Number		276215	
Antenna connectors		N-Female	F-Female
Antenna impedance		50 ohm	75 ohm
Dimensions		5.7 x 4.2 x 1.5 inch (14.0 x 10.8 x 3.9 cm)	
Weight		1.27 lbs (0.544 kg)	
Frequency		824-894 MHz / 1850-1990 MHz	
[1]**Passband Gain (nominal)**			
800 MHz	uplink / downlink	17 dB typical, 19 dB max / 17 dB typical, 19 dB max	
1900 MHz	uplink / downlink	17 dB typical, 19 dB max / 17 dB typical, 19 dB max	

[2]**20 dB Bandwidth (nominal)**	Uplink	Downlink
800 MHz	26 MHz typical, 29 MHz maximum	29 MHz typical, 32 MHz max
1900 MHz	63 MHz typical, 69 MHz maximum	63 MHz typical, 70 MHz max

Power Output	800 MHz	1900 MHz
Power output for single cell phone (uplink)	-3.7 dBm	-2 dBm
Power output for single received channel (downlink)	30.2 dBm	30.5 dBm

[3]**Power output for multiple transmitted channels (uplink)**		Maximum Power	
The maximum power is reduced by the number of channels:	Number of channels	800 MHz	1900 MHz
	2	-10.6 dBm	-9.4 dBm
	3	-14.1 dBm	-12.9 dBm
	4	-16.6 dBm	-15.4 dBm
	5	-18.5 dBm	-17.4 dBm
	6	-20.1 dBm	-19.0 dBm

[4]**Power output for multiple received channels (downlink)**		Maximum Power	
The maximum power is reduced by the number of channels:	Number of channels	800 MHz	1900 MHz
	2	22.3 dBm	21 dBm
	3	18.8 dBm	17.4 dBm
	4	16.3dBm	14.9 dBm
	5	14.4 dBm	13.0 dBm
	6	12.8 dBm	11.4 dBm

Noise Figure (typical downlink/uplink)	3.5 dB nominal / 6 dB nominal
Isolation	> 45 dB
Power Requirements	110-240 V AC, 50-60 Hz, 8 W

Notes:

1. Nominal gain is the maximum gain at any frequency in the passband.
2. Nominal bandwidth is the difference between two frequencies that are adjacent to the passband where the amplification is 20 dB lower than the passband amplification. One of the frequencies is lower than the passband and the other is higher.
3. The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.
4. The maximum power for 2 or more simultaneous signals will be reduced by 6 dB every time the number of signals is doubled.

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For additional Technical Support visit www.WilsonElectronics.com

or email at: tech@wilsonelectronics.com

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